

WHAT IS CLAIMED IS:

1. An optical recording/reproducing method for optically recording or reproducing information with respect to an optical recording medium by using an optical recording apparatus, comprising:
- a loading step of loading the optical recording medium in the optical recording apparatus;
  - a reproduction power setting step of setting a power of laser light emitted from the optical recording apparatus to the optical recording medium at reproduction power;
  - a management information reproduction step of reproducing management information for managing user information recorded on the optical recording medium with laser light having the reproduction power; and
  - a recording learning step of extracting a recording condition suitable for the optical recording medium,
- wherein the recording learning step is conducted after the management information reproduction step.
2. An optical recording/reproducing method according to claim 1, wherein the recording learning step is at least one selected from the group consisting of a recording power learning step of extracting a laser emission power suitable for the optical recording medium, a recording pulse learning step of extracting a recording pulse condition suitable for the optical recording medium, a recording servo learning step of extracting a servo condition suitable for the optical recording medium during recording, a groove parameter learning step of determining a groove parameter of the optical recording medium, and an equalizing amount learning step of determining an equalizing amount with respect to the optical recording medium.
3. An optical recording/reproducing method for optically recording or reproducing information with respect to an optical recording medium by using an optical recording apparatus, comprising:
- a loading step of loading the optical recording medium in the optical recording apparatus;
  - a reproduction power setting step of setting a power of laser light emitted from the optical recording apparatus to the optical recording medium at reproduction power;

a preliminary information reproduction step of reproducing preliminary information recorded on the optical recording medium with laser light having the reproduction power;

5 a count-up step of starting count-up of a time after completion of the preliminary information reproduction step; and

a recording learning step of extracting a recording condition suitable for the optical recording medium,

10 wherein the recording learning step is conducted after a time counted up during the count-up step becomes at least a predetermined time.

4. An optical recording/reproducing method according to claim 3, wherein, in the count-up step, count-up is continued unless recording or reproduction of user information is requested,

15 when recording of the user information is requested, a process proceeds to the recording learning step, and

when reproduction of the user information is requested, the process proceeds to a user information reproduction step of reproducing user information recorded on the optical recording medium with laser light having the reproduction power, and after the user information reproduction step,  
20 count-up of a time is restarted after the counted time is reset.

5. An optical recording/reproducing method according to claim 3, further comprising a recording learning preference mode and a reproduction preference mode that are selected alternatively,

25 wherein, when the recording learning preference mode is selected, the process proceeds from the preliminary information reproduction step to the recording learning step, and

when the reproduction preference mode is selected, the process proceeds from the preliminary information reproduction step to the count-up step.  
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6. An optical recording/reproducing method according to claim 3, wherein, in the recording learning step conducted after the count-up step, when reproduction of user information is requested, the recording learning step is  
35 suspended, the process proceeds to a user information reproduction step of reproducing user information recorded on the optical recording medium with laser light having the reproduction power, and the recording learning step is

restarted after the user information reproduction step.

5 7. An optical recording/reproducing method according to claim 3, wherein the recording learning step is at least one selected from the group consisting of a recording power learning step of extracting a laser emission power suitable for the optical recording medium, a recording pulse learning step of extracting a recording pulse condition suitable for the optical recording medium, a recording servo learning step of extracting a servo condition suitable for the optical recording medium during recording, a groove parameter learning step of determining a groove parameter of the optical recording medium, and an equalizing amount learning step of determining an equalizing amount with respect to the optical recording medium.

15 8. An optical recording/reproducing method for optically recording or reproducing information with respect to an optical recording medium by using an optical recording apparatus, comprising:

a loading step of loading the optical recording medium in the optical recording apparatus;

20 a reproduction power setting step of setting a power of laser light emitted from the optical recording apparatus to the optical recording medium at reproduction power; and

a recording possibility identifying step of identifying a possibility of recording information on the optical recording medium, based on a recording identifier,

25 wherein, when prohibition of recording is identified in the recording possibility identifying step, a process proceeds to a user information reproduction step of reproducing user information recorded on the optical recording medium with laser light having the reproduction power, or a reproduction standby step of waiting for a request for reproduction of the user information, and

30 when permission of recording is identified in the recording possibility identifying step, a management information reproduction step of reproducing management information for managing user information recorded on the optical recording medium with laser light having the reproduction power, and  
35 then a recording learning step of extracting a recording condition suitable for the optical recording medium are conducted.

9. An optical recording/reproducing method according to claim 8, wherein the recording identifier is provided at the optical recording medium.
10. An optical recording/reproducing method according to claim 8, wherein the  
5 recording identifier is provided at a case accommodating the optical recording medium.
11. An optical recording/reproducing method according to claim 8, wherein the  
10 recording identifier includes a first recording identifier provided at the optical recording medium and a second recording identifier provided at a case accommodating the optical recording medium.
12. An optical recording/reproducing method according to claim 8, wherein the  
15 recording learning step is at least one selected from the group consisting of a recording power learning step of extracting a laser emission power suitable for the optical recording medium, a recording pulse learning step of extracting a recording pulse condition suitable for the optical recording medium, a recording servo learning step of extracting a servo condition suitable for the optical recording medium during recording, a groove parameter learning step  
20 of determining a groove parameter of the optical recording medium, and an equalizing amount learning step of determining an equalizing amount with respect to the optical recording medium.
13. An optical recording/reproducing method for optically recording or  
25 reproducing information with respect to an optical recording medium by using an optical recording apparatus, comprising:
- a loading step of loading the optical recording medium in the optical recording apparatus;
  - a reproduction power setting step of setting a power of laser light  
30 emitted from the optical recording apparatus to the optical recording medium at reproduction power; and
  - a recording possibility identifying step of identifying a possibility of recording information on the optical recording medium, based on a recording identifier,
- 35 wherein, when prohibition of recording is identified in the recording possibility identifying step, a process proceeds to a user information reproduction step of reproducing user information recorded on the optical

recording medium with laser light having the reproduction power, or a reproduction standby step of waiting for a request for reproduction of the user information, and

5 when permission of recording is identified in the recording possibility identifying step, a preliminary information reproduction step of reproducing preliminary information recorded on the optical recording medium, with laser light having the reproduction power, a count-up step of starting count-up of a time after completion of the preliminary information reproduction step, and  
10 a recording learning step of extracting a recording condition suitable for the optical recording medium are conducted in this order, and the recording learning step is conducted after a time counted up during the count-up step becomes at least a predetermined time.

14. An optical recording/reproducing method according to claim 13, wherein  
15 the recording identifier is provided at the optical recording medium.

15. An optical recording/reproducing method according to claim 13, wherein the recording identifier is provided at a case accommodating the optical  
20 recording medium.

16. An optical recording/reproducing method according to claim 13, wherein the recording identifier includes a first recording identifier provided at the optical recording medium and a second recording identifier provided at a case  
25 accommodating the optical recording medium.

17. An optical recording/reproducing method according to claim 13, wherein the recording learning step is at least one selected from the group consisting of a recording power learning step of extracting a laser emission power suitable for the optical recording medium, a recording pulse learning step of extracting  
30 a recording pulse condition suitable for the optical recording medium, a recording servo learning step of extracting a servo condition suitable for the optical recording medium during recording, a groove parameter learning step of determining a groove parameter of the optical recording medium, and an equalizing amount learning step of determining an equalizing amount with  
35 respect to the optical recording medium.

18. An optical recording/reproducing method for optically recording or

reproducing information with respect to an optical recording medium by using an optical recording apparatus, comprising:

a loading step of loading the optical recording medium in the optical recording apparatus;

5 a reproduction power setting step of setting a power of laser light emitted from the optical recording apparatus to the optical recording medium at reproduction power;

a recording possibility identifying step of identifying a possibility of recording information on the optical recording medium, based on a recording  
10 identifier; and

a rotation speed control step of controlling a rotation speed of the optical recording medium, based on the identified possibility of recording, wherein, when prohibition of recording is identified during the recording possibility identifying step, a mode of prescribing a rotation speed of the optical recording medium to be constant is selected during the rotation  
15 speed control step, and

when permission of recording is identified during the recording possibility identifying step, a mode of controlling a rotation speed of the optical recording medium for each region so as to alleviate a difference in scanning speed of the laser light in a plurality of regions partitioned based on a distance from a rotation center of the optical recording medium is selected during the rotation speed control step.

19. An optical recording/reproducing method according to claim 18, wherein, when permission of recording is identified during the recording possibility  
25 identifying step, a rotation speed of the optical recording medium is controlled for each of the regions so that a scanning speed of laser light becomes substantially the same in the plurality of regions.

20: An optical recording/reproducing method of an optical recording medium according to claim 18, wherein, when prohibition of recording is identified during the recording possibility identifying step, a user information reproduction step of reproducing user information recorded on the optical recording medium with laser light having the reproduction power, or a  
30 reproduction standby step of waiting for a request for reproduction of the user information is conducted, and

when permission of recording is identified during the recording

possibility identifying step, a management information reproduction step of reproducing management information for managing user information recorded on the optical recording medium, with laser light having the reproduction power, and a recording learning step of extracting a recording condition suitable for the optical recording medium are further conducted in this order.

21. An optical recording/reproducing method according to claim 20, wherein the recording learning step is at least one selected from the group consisting of a recording power learning step of extracting a laser emission power suitable for the optical recording medium, a recording pulse learning step of extracting a recording pulse condition suitable for the optical recording medium, a recording servo learning step of extracting a servo condition suitable for the optical recording medium during recording, a groove parameter learning step of determining a groove parameter of the optical recording medium, and an equalizing amount learning step of determining an equalizing amount with respect to the optical recording medium.

22. An optical recording/reproducing method according to claim 18, wherein, when prohibition of recording is identified during the recording possibility identifying step, a user information reproduction step of reproducing user information recorded on an optical recording medium, with laser light having the reproduction power, or a reproduction standby step of waiting for a request for reproduction of the user information is further conducted, and when permission of recording is identified during the recording possibility identifying step, a preliminary information reproduction step of reproducing preliminary information recorded on the optical recording medium with laser light having the reproduction power, a count-up step of starting count-up of a time after completion of the preliminary information reproduction step, and a recording learning step of extracting a recording condition suitable for the optical recording medium are conducted in this order, and the recording learning step is further conducted when a time counted up during the count-up step becomes at least a predetermined time.

23. An optical recording/reproducing method according to claim 22, wherein the recording learning step is at least one selected from the group consisting of a recording power learning step of extracting a laser emission power suitable

for the optical recording medium, a recording pulse learning step of extracting a recording pulse condition suitable for the optical recording medium, a recording servo learning step of extracting a servo condition suitable for the optical recording medium during recording, a groove parameter learning step of determining a groove parameter of the optical recording medium, and an equalizing amount learning step of determining an equalizing amount with respect to the optical recording medium.

24. An optical recording apparatus for optically recording or reproducing information with respect to an optical recording medium, comprising:  
loading means for loading the optical recording medium;  
an optical head for emitting laser light to the loaded optical recording medium;  
reproduction power setting means for setting a power of the laser light at reproduction power;  
information reproduction means for reproducing information recorded on the optical recording medium, with laser light having the reproduction power;  
recording learning means for extracting a recording condition suitable for the optical recording medium; and  
control means for allowing the information reproduction means to reproduce management information for managing user information recorded on the optical recording medium, and then, operating the recording learning means.

25. An optical recording apparatus according to claim 24, wherein the recording learning means is at least one selected from the group consisting of recording power learning means for extracting a laser emission power suitable for the optical recording medium, recording pulse learning means for extracting a recording pulse condition suitable for the optical recording medium, recording servo learning means for extracting a servo condition suitable for the optical recording medium during recording, groove parameter learning means for determining a groove parameter of the optical recording medium, and equalizing amount learning means for determining an equalizing amount with respect to the optical recording medium.

26. An optical recording apparatus for optically recording or reproducing



information with respect to an optical recording medium, comprising:

loading means for loading the optical recording medium;

an optical head for emitting laser light to the loaded optical recording medium;

5 reproduction power setting means for setting a power of the laser light at reproduction power;

information reproduction means for reproducing information recorded on the optical recording medium, with laser light having the reproduction power;

10 count-up means for starting count-up of a time after completion of a reproduction operation of preliminary information recorded on the optical recording medium by the information reproduction means;

recording learning means for extracting a recording condition suitable for the optical recording medium; and

15 control means for operating the recording learning means after a time counted up by the count-up means becomes at least a predetermined time.

27. An optical recording apparatus according to claim 26, wherein, during an operation of the count-up means, the control means allows the operation of the count-up means to continue unless recording or reproduction of user information is requested,

when recording of the user information is requested, the control means operates the recording learning means, and

25 when reproduction of the user information is requested, the control means allows the information reproduction means to reproduce information recorded on the optical recording medium with laser light having the reproduction power, and restarts the operation of the count-up means after resetting of a time counted up by the count-up means after completion of the operation of the information reproduction means.

30 28. An optical recording apparatus according to claim 26, wherein the optical recording apparatus further comprises preferential mode selection means for selecting a recording learning preference mode and a reproduction preference mode alternatively,

35 when the recording learning preference mode is selected by the preferential mode selection means, the control means operates the recording learning means after completion of a reproduction operation of the

preliminary information by the information reproduction means, and  
when the reproduction preference mode is selected by the preferential  
mode selection means, the control means operates the count-up means after  
completion of the reproduction operation by the information reproduction  
5 means.

29. An optical recording apparatus according to claim 26, wherein, during an  
operation of the recording learning means after an operation of the count-up  
means, when reproduction of user information is requested, the control means  
10 suspends the operation of the recording learning means to operate the  
information reproduction means, and restarts the operation of the recording  
learning means after completion of the operation of the information  
reproduction means.

30. An optical recording apparatus according to claim 26, wherein the  
recording learning means is at least one selected from the group consisting of  
recording power learning means for extracting a laser emission power suitable  
for the optical recording medium, recording pulse learning means for  
extracting a recording pulse condition suitable for the optical recording  
20 medium, recording servo learning means for extracting a servo condition  
suitable for the optical recording medium during recording, groove parameter  
learning means for determining a groove parameter of the optical recording  
medium, and equalizing amount learning means for determining an  
equalizing amount with respect to the optical recording medium.

31. An optical recording apparatus for optically recording or reproducing  
information with respect to an optical recording medium, comprising:  
loading means for loading the optical recording medium;  
an optical head for emitting laser light to the loaded optical recording  
30 medium;  
reproduction power setting means for setting a power of the laser light  
at reproduction power;  
recording possibility identifying means for identifying a possibility of  
recording information on the optical recording medium based on a recording  
35 identifier;  
information reproduction means for reproducing information recorded  
on the optical recording medium with laser light having the reproduction

power;

recording learning means for extracting a recording condition suitable for the optical recording medium; and

5 control means for, when prohibition of recording is identified by the recording possibility identifying means, operating the information reproduction means immediately after completion of an operation of the recording possibility identifying means and the reproduction power setting means, or in response to a request for reproduction of the information after completion of operations of the recording possibility identifying means and the reproduction power setting means, and, when permission of recording is identified by the recording possibility identifying means, after completion of operations of the reproduction power setting means and the recording possibility identifying means, allowing the information reproduction means to reproduce management information for managing user information recorded on the optical recording medium, and then, operating the recording learning means.

20 32. An optical recording/reproducing method according to claim 31, wherein the recording identifier is provided at the optical recording medium.

33. An optical recording/reproducing method according to claim 31, wherein the recording identifier is provided at a case accommodating the optical recording medium.

25 34. An optical recording/reproducing method according to claim 31, wherein the recording identifier comprises a first recording identifier provided at the optical recording medium and a second recording identifier provided at a case accommodating the optical recording medium.

30 35. An optical recording apparatus according to claim 31, wherein the recording learning means is at least one selected from the group consisting of recording power learning means for extracting a laser emission power suitable for the optical recording medium, recording pulse learning means for extracting a recording pulse condition suitable for the optical recording medium, recording servo learning means for extracting a servo condition suitable for the optical recording medium during recording, a groove parameter learning means for determining a groove parameter of the optical

recording medium, and equalizing amount learning means for determining an equalizing amount with respect to the optical recording medium.

36. An optical recording apparatus for optically recording or reproducing  
5 information with respect to an optical recording medium, comprising:  
loading means for loading the optical recording medium;  
an optical head for emitting laser light to the loaded optical recording  
medium;  
reproduction power setting means for setting a power of the laser light  
10 at reproduction power;  
recording possibility identifying means for identifying a possibility of  
recording information on the optical recording medium based on a recording  
identifier;  
information reproduction means for reproducing information recorded  
15 on the optical recording medium with laser light having the reproduction  
power;  
count-up means for starting count-up of a time after completion of an  
operation of the information reproduction means;  
recording learning means for extracting a recording condition suitable  
20 for the optical recording medium; and  
control means for, when prohibition of recording is identified by the  
recording possibility identifying means, operating the information  
reproduction means immediately after completion of operations of the  
recording possibility identifying means and the reproduction power setting  
25 means, or in response to a request for reproduction of the information after  
completion of operations of the recording possibility identifying means and the  
reproduction power setting means, and  
when permission of recording is identified by the recording possibility  
identifying means, allowing the information reproduction means to reproduce  
30 preliminary information recorded on the optical recording medium after  
completion of operations of the recording possibility identifying means and the  
reproduction power setting means, operating the count-up means after  
completion of an operation of the information reproduction means, and  
operating the recording learning means after a time counted up by the count-  
35 up means becomes at least a predetermined time.

37. An optical recording/reproducing method according to claim 36, wherein

the recording identifier is provided at the optical recording medium.

38. An optical recording/reproducing method according to claim 36, wherein the recording identifier is provided at a case accommodating the optical recording medium.

39. An optical <sup>recording apparatus</sup> ~~recording/reproducing method~~ according to claim 36, wherein the recording identifier comprises a first recording identifier provided at the optical recording medium and a second recording identifier provided at a case accommodating the optical recording medium.

40. An optical recording apparatus according to claim 36, wherein the recording learning means is at least one selected from the group consisting of recording power learning means for extracting a laser emission power suitable for the optical recording medium, recording pulse learning means for extracting a recording pulse condition suitable for the optical recording medium, recording servo learning means for extracting a servo condition suitable for the optical recording medium during recording, groove parameter learning means for determining a groove parameter of the optical recording medium, and equalizing amount learning means for determining an equalizing amount with respect to the optical recording medium.

41. An optical recording apparatus for optically recording or reproducing information with respect to an optical recording medium, comprising:

- loading means for loading the optical recording medium;
- an optical head for emitting laser light to the loaded optical recording medium;
- reproduction power setting means for setting a power of the laser light at reproduction power;
- recording possibility identifying means for identifying a possibility of recording information on the optical recording medium based on a recording identifier;
- information reproduction means for reproducing information recorded on the optical recording medium with laser light having the reproduction power;
- rotation speed control means for controlling a rotation speed of the optical recording medium; and

control means for, when prohibition of recording is identified by the recording possibility identifying means, selecting a mode of allowing the rotation speed control means to control a rotation speed of the optical recording medium to be constant, and

5       when permission of recording is identified by the recording possibility identifying means, selecting a mode of allowing the rotation speed control means to control a rotation speed of the optical recording medium for each region so as to alleviate the difference in scanning speed of the laser light in a plurality of regions of the optical recording medium partitioned based on a  
10 distance from a rotation center.

42. An optical recording apparatus according to claim 41, wherein, when permission of recording is identified by the recording possibility identifying means, the control means controls a rotation speed of the optical recording  
15 medium for each region so that a scanning speed of laser light in a plurality of regions becomes substantially the same.

43. An optical recording apparatus according to claim 41, wherein, when prohibition of recording is identified by the recording possibility identifying means, the control means operates the information reproduction means immediately after completion of an operation of the rotation speed control means, or in response to a request for reproduction of the information after completion of an operation of the rotation speed control means, and  
20       when permission of recording is identified by the recording possibility identifying means, after completion of an operation of the rotation speed control means, the control means allows the information reproduction means to reproduce management information for managing user information recorded on the optical recording medium, and then operates recording learning means for extracting a recording condition suitable for the optical  
25 recording means.  
30

44. An optical recording apparatus according to claim 43, wherein the recording learning means is at least one selected from the group consisting of recording power learning means for extracting a laser emission power suitable  
35 for the optical recording medium, recording pulse learning means for extracting a recording pulse condition suitable for the optical recording medium, recording servo learning means for extracting a servo condition

suitable for the optical recording medium during recording, groove parameter learning means for determining a groove parameter of the optical recording medium, and equalizing amount learning means for determining an equalizing amount with respect to the optical recording medium.

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45. An optical recording apparatus according to claim 41, wherein, when prohibition of recording is identified by the recording possibility identifying means, the control means operates the information reproduction means immediately after completion of an operation of the rotation speed control means, or in response to a request for reproduction of the information after completion of an operation of the rotation speed control means, and  
A when <sup>permission</sup>~~prohibition~~ of recording is identified by the recording possibility identifying means, the control means allows the information reproduction means to reproduce preliminary information recorded on the optical recording medium after completion of an operation of the rotation speed control means, operates the count-up means after completion of an operation of the information reproduction means, and operates recording learning means for extracting a recording condition suitable for the optical recording medium after a time counted up by the count-up means becomes at least a  
15  
20 predetermined time.

46. An optical recording apparatus according to claim 45, wherein the recording learning means is at least one selected from the group consisting of recording power learning means for extracting a laser emission power suitable  
25 for the optical recording medium, recording pulse learning means for extracting a recording pulse condition suitable for the optical recording medium, recording servo learning means for extracting a servo condition suitable for the optical recording medium during recording, groove parameter learning means for determining a groove parameter of the optical recording  
30 medium, and equalizing amount learning means for determining an equalizing amount with respect to the optical recording medium.